

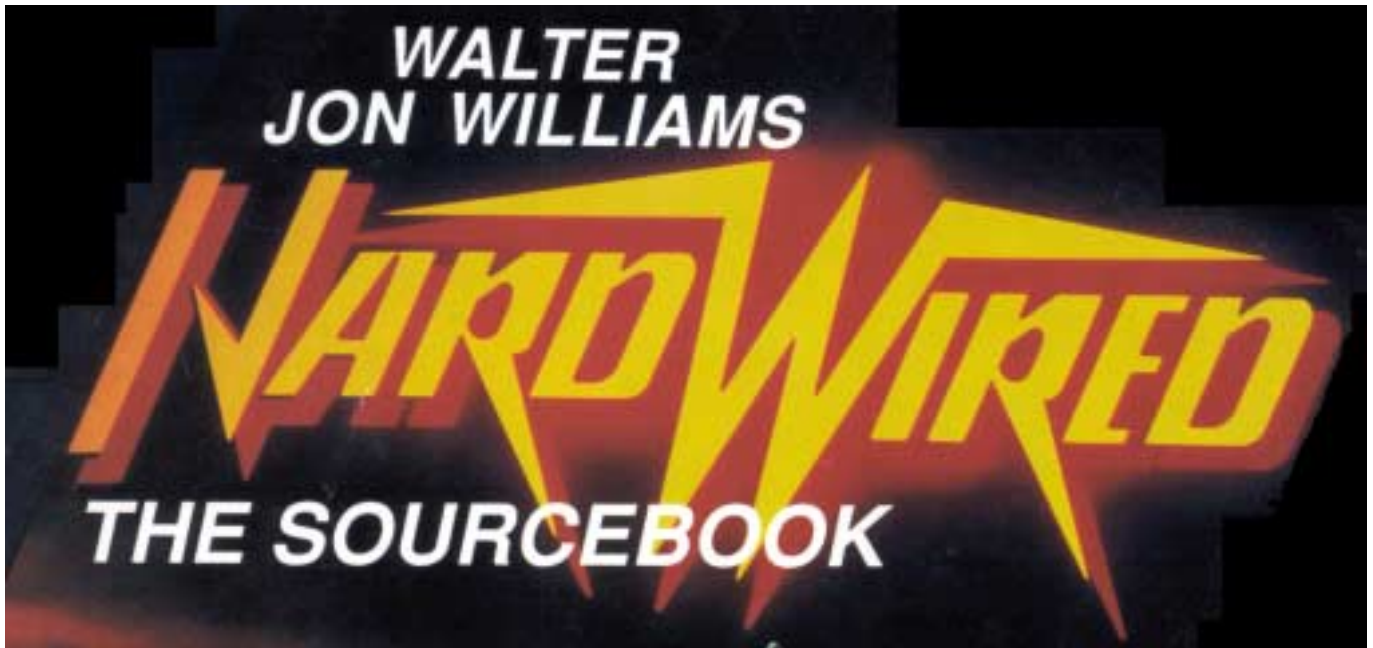
**HARDWIRED**

# NETRUNNING

*THE CRYSTALJOCK  
IS A WHOLE NEW  
BREED OF  
NETRUNNER. BUT  
HE STILL RUNS THE  
WIRES TO THE  
RAGGED EDGE...*



Hankson Fong



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I scanned this part of the book because I think the netrunning section is a very good idea. Unfortunately the book has been out of print for several years now. That means that most people are not aware of the good ideas the book offered. Since no one sells it anymore I hope the holder of the copyright does not mind. The file can be found on [www.cyberpunk2020.de](http://www.cyberpunk2020.de) and must not be sold! Otherwise my doing would be illegal. And we don't want that, do we?

Karsten

## NETRUNNING IN HARDWIRED

Anyone can get into the Net. But not just anyone can be a Runner. A netrunner

has to be fast and sharp-or she may wind up dead.

Fried brains? No, in *Hardwired*, that technology hasn't yet been developed. Nobody dies in the Net. Dying *because* of what one does in the Net-that's different. Monitors are everywhere, and Sysops are on the watch; it takes real ingenuity to run the Net without being noticed. One false step and a Runner can lose his account and be back at square one with the illiterates....and perhaps with Big Brother knocking at the door.

To get a real feel for *Hardwired's* netrunning world, go down to the Video store and rent a copy of the movie *Wargames*. Note how the hero (capably played by Matthew Broderick), gets into various accounts through deducing codes, file names and access gates. This is the key to 'running in *Hardwired*.

The canned programs that are the staple of *Cyberpunk* are seldom used, many are too well known and defenses have been designed to counter them. In addition, the Orbitals have introduced their own versions into the market-sabotaged, of course. (There is a 35% chance that any canned program a crystaljock purchases has been booby-trapped, either to destroy the crystaljock's deck and all his files (10%) or to implant subliminal instructions in the crystaljock's brain (25%) which will cause him to carry out the seller's bidding, such as kill any employee of the competition he may encounter.)

Besides, any crystaljock worthy of the name can write much better stuff than the canned tripe. He uses EBASIC - Evolved BASIC - the state-of-the-art programming language that has universally replaced all other languages (like FORTRAN and COBOL). In the end, a Netrunner must use programming and his own wits to survive.

## THE BAD GUYS: SYSOPS

A Sysop, or System Operator, is a person who oversees the operations of

a computer system. He is on the lookout for crystaljocks using his system illegally – when your account dies, it's because the Sysop has noticed your unauthorized activity and terminated the account. Some Sysops are more easygoing than others and are willing to chat with crystaljocks. They may even be talked into providing crystaljocks with accounts upon occasion.

It is more likely, however, that the Sysop will try to trace the crystaljock and discover his identity (after all, that's his job), The Sysop may call in the police and/or press charges against the crystaljock. That's if the crystaljock is lucky. The Sysop might also decide to call in mercenaries or corporate goons to go to the crystaljock's hideout, beat him into a pulp, and destroy or confiscate his deck and LC blocks. (This is one reason why mighty crystaljocks deign to associate with lowly solos.)

The *Hardwired* universe is very different than the Net of *Cyberpunk*. For one thing, there's no *there* there- no vast 'conceptual hallucination" (to quote cyberpunk author William Gibson) in which netridders can meet. Instead, netrunning in *Hardwired* is very much like hacking in the 20th century. **Many "Runners (known as crystaljocks)**, use keyboards instead of jacks. Instead of moving into data fortresses or cracking systems directly, the crystaljock tries to enter via computer passwords, system files and bulletin boards. There isn't even a "Net"; the crystaljock calls this web of telecommunications lines the 'face' (Short for the interface).

The *Hardwired* universe doesn't have all the nifty lethal programming of *Cyberpunk*. This is a hacker's universe, and designed for hacking, rather than a video game run. But if you're feeling nasty, you can assume that in your game that the various killer programs of *Cyberpunk* do exist and can be activated as needed.

Obviously, those programs which do things directly to the crystaljock/netrunner's brain will only work if he is using a direct plug into the face. However, deck killers like **Poison Flatline** will wipe out even keyboard decks.

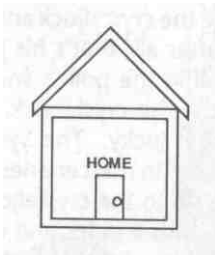
The "nasty program" phase of combat should take place whenever a crystaljock has been detected by a Sysop. Combat is as in *Cyberpunk* (*View From the Edge*, pg. 37), but the crystaljock uses his System Knowledge Skill instead of his Interface Ability. If he is using a direct plug link to the face, he may add an additional +2 to his rolls, However, he risks the chance that he will get clobbered by a serious program.

# THE 'FACE

The first thing a crystaljock needs to know about the world of the interface is how it's constructed. The 'face is made up of five areas: **Home, Local Environment, Bulletin Boards, the Workspace** and **Paths.**

## Home

The crystaljock's point of origin is called "Home." Usually this is the crystaljock's deck, but if he is using a terminal on a computer system or some other means of accessing the Net, then that is Home.



## Local Environment

The Local environment is a term meaning the computer you are currently in. When a crystaljock first enters the 'Face, before making any connections to other systems, his Local environment is his Home environment or computer. When he moves to another system (such as a corporate computer or bulletin board) using one of his account numbers, that computer system becomes his Local environment.

While in the local environment, the crystaljock can ask that computer to perform certain tasks for him, depending on his level of skill and access to that system. He can instruct that computer to open accounts for him, copy account files to his Home environment computer, move files around or even delete files. If, of course, he has the right passwords.

**Bulletin Boards:** One special type of local environment that you will often encounter is a **bulletin board**. A bulletin board (or BBS) is a computer system used to exchange information electronically, in the form of messages, articles, "face to face" conversations, etc. The bulletin board Sysop usually starts a crystaljock out with a limited access that allows him to send and receive mail, participate in discussions, mail-order shop for things, and read various announcements provided for the bulletin board's users. Most bulletin boards are public and can be reached by simply entering the 'face and calling up the board. Some of these have themes of interest or offer specific services-such as the Mercs-R-Us board in 'Trojan's Run!'

**Private bulletin boards** are set up by small groups for their own use. Access to these is limited to those in the group. Crystaljock boards and Black Market boards fall into this category.

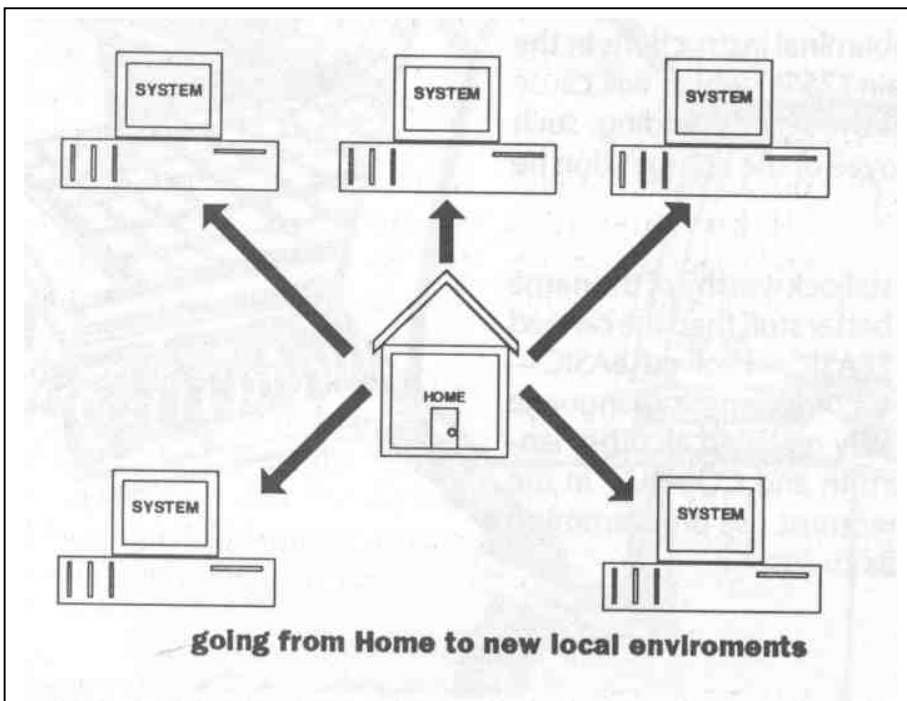
## Paths

The sequence of systems through which a crystaljock or his programs have passed is called his **path**. (Example: You use the

The easiest way to think of working the 'face is to think of it as a series of roadways, along which you are driving a car. As with any journey, the first place you start from is Home.

In our car analogy, Home is the place where you start your trip.

Think of the Local Environment as the "place" you are driving to. For example, if you drove to a drive-in, that would currently be the Local environment. When you drove to a motel, that would become the Loci environment. Another name for local environment is system.



'face to link through Los Angeles to Honolulu to Tokyo, enter the Tokyo phone company's system through an account, and enter that account's inter-office mail files. Your path is LA/Honolulu/Tokyo/Bell Telecommunications/Mail.) A crystaljock can use a PATH (see Programming, pg. 56) command to send things to other directories or systems, provided his account is high-level enough to do so. Keeping track of various paths is important as they allow the crystaljock to move things around between different accounts and systems.

## ACCOUNTS

Accounts are the backbone of the 'face. They are where information is stored, moved to and removed from. The best way to think of an account is to compare it to a savings account in a bank. When you open a bank account, the bank gives you a code number which you use to put money into the bank or take it out again. If someone else had your code number (or account number), they could possibly go to your bank and take out all the money you had placed there.

'Face accounts are like bank accounts. You apply to the Sysop of that particular computer system, who, like a banker, opens an account for you and gives you an account number to allow you to access your new account. Each account resides in a particular computer system, and each has its own account number.

To keep people from illicitly entering your account, the Sysop allows you to choose or invent your own secret code, which must be used along with your account number to open your account. He keeps a record of this in his computer, and watches to make sure that no one else enters your accounts without permission.

Anyone with a telephone service *automatically* has an account allowing basic access to the 'face. It's part of the phone bill. Access to the computer systems that fascinate 'crystaljocks is another matter—such accounts are hard to come by. Occasionally they may be purchased (expensively), but the majority of a crystaljock's accounts are obtained illicitly.

Illegal or unpaid-for accounts have a limited lifespan (3D10 weeks) before they are discovered and terminated by the system operators. The lifespan is shortened every time another person obtains access. (If Johnny Hack trades the account to 30 other crystaljocks, it will die very quickly.) This applies only to illicitly obtained accounts, of course. Accounts that the crystaljock is paying for, such as bulletin boards, will not die. (Usually.)

A crystaljock keeps a stable of around three to eighteen accounts of various types, obtaining their numbers and passwords by stealing passwords or by trade with other crystaljocks. (It is possible for an unwary crystaljock to trade information with a Sysop or a cop, with obvious results.) A crystaljock who doesn't have something worth trading can owe favors to other crystaljocks, but will soon have nobody to trade with if the favors aren't fulfilled.

As the game continues, the crystaljock will need to gain new accounts to replace those which die, or to meet the needs of a specific mission. This is done by **hacking** - illegally figuring out ways to get new accounts or the codes for existing accounts.

### TYPES OF ACCOUNTS

**Open Door:** A demo or games account. Many systems have them under names like "game," "demo," or "hello," without passwords. This type of account is very limited; no programming may be done from the account, no access to other files is allowed. The crystaljock may attempt to get past the routine that runs the games or demo (roll System Knowledge skill vs 20), which may get him into the main system. He can then look at the directory of the open door account which will contain all the files used to run the games or the demo program, and may also contain useful information, such as account numbers or names. From the system prompt, the crystaljock may try to run HELP for more information about his local environment or may look in

If your trip through the 'face is like a trip on a road, the Path would be a roadmap showing your entire trip. Like a roadmap, you could use a Path to direct other people to where they wanted to go (or send flies down a Path to your Home).



A system prompt is a flashing box or arrow that tells you when you have reached the main system of **the computer and can** possibly access other accounts.

the mailbox (if there is one). He can read what's there, but cannot read mail in any other accounts, and cannot send mail. Not much else can be done in an open door account.

**Limited:** The kind of account held by an average employee of a company. Can read and write files only in your own personal account. Can read but not write into any public accounts or files. Can run programs that are already on the system (such as word processing or games). Cannot be used to create or execute other programs. Can receive and send mail if you know the proper account number to send it to.

**Programmer:** In addition to the rights of a Limited account, programmer accounts can be used to write and run programs that will act within your personal accounts. May use public files for information, but may not write into or erase public files.

**Accountant:** This kind of account is held by business owners or accountants, and has control of financial data. Often this will include authorization of financial transactions, control of stocks and monetary accounts, etc. Includes full access to financial data, which is not usually public.

**Sysop:** The System Operator has supreme control of the computer. This kind of account includes the power to create and destroy new accounts of any level; read, write and delete (erase) any files on the system (in any account); access to all accounts and passwords, etc. (In short, omnipotence.)

**Back Door:** A secret command password which, when entered from any other system account (including open doors) bypasses all system security and temporarily changes the level of the account to Sysop. These powerful commands are created by Sysops for their own use and are tough to find.

**Starting Accounts**

A new crystaljock rolls 3D6 to determine the number of accounts he has. For each account, roll 1 D10 against the following table. For a roll of 10, roll again. Each level

includes the rights of the preceding level(s). (Note: Basic 'face access is a Limited count.)

D10 Roll	Level
1	Open Door
2-5	Limited
6-8	Programmer
9	Accountant
10	Roll again:
	1-7 Accountant
	8-9 Back Door
	10 Sysop

The value of an account will depend on the crystaljock's needs and on the type of system the account is on. For example, a Sysop account on the computer of Mom & Pop's Floral Shoppe may be practically useless, while a even a Limited account on Thaler Corporation's mainframe may give access to very valuable information. Use the following table to determine what kind of person or company owns the system the account is on.

Roll (D100)	System
01-25	Bulletin Board
26-28	Crystaljocks' Bulletin Board
29-30	Black Market Bulletin Board
31-40	Small Business
41-50	Large Business
51-55	Chain storereastaurant
56-60	Transportation Company Terminal
61-65	City or State Government
66-70	Police
71-75	Hospital
76-80	High School
81-85	College or University
86-90	Phone Company (Ref determines area)
91-94	Mercenary Company
95-96	Bank
97-98	Face Bank
99-100	Orbital

A public account or file is one which anyone in that particular system can get into. However, certain accounts are limited to only reading these contents of a public file. For example, a phone directory is a public file, but only the Telephone Company can add new numbers to it

## FILES

Inside every account are hundreds of **files**. Files are what the crystaljock is after. A file can contain information

(such as correspondence or accounting info) or programs. The **filename** can be any name, series of letters, or group of words that the computer uses to identify a file. A filename can be any length (even a sentence). An example of a file name might be PATTY'S JUNK which is a name of a file holding Patty's letters and notes, and is kept in Patty's personal account.

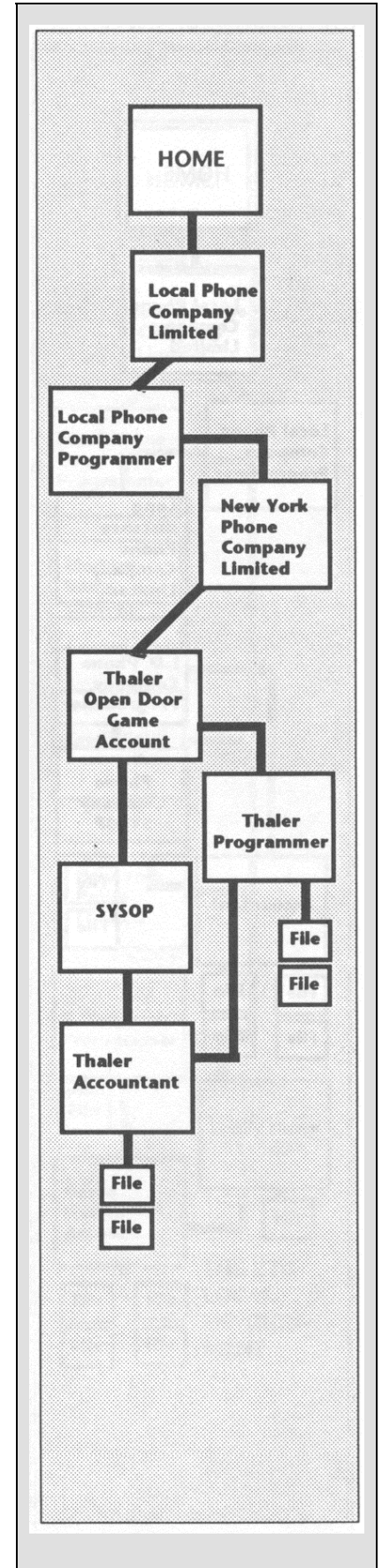
If a crystaljock were planning to, let's say, lift a million dollars out of a Thaler account, he would first of all have to get the account number and password to enter the account. He would then have to locate the exact file in which Thaler kept it's accounting information, and manipulate that file to transfer a million dollars out of that file into a file of his own.

## MORE CRYSTAL JOCK TERMS

Here are a few more terms you'll encounter as a novice crystaljock:

**Crash:** A crash is a catastrophic system failure caused by programming error or physical disruption of the hardware.

**Workspace:** The workspace is a place in your account that contains whatever data the crystaljock is currently looking at or working on. Think of the workspace as a "desk on which the crystaljock is currently working, taking things out of his account files, spreading them out in the workspace, and working on them there. The workspace can contain more data than is visible on a computer screen. Things in the workspace can be lost through power outages or other computer crashes, unless they have been copied into a file. (Example: You



are editing a previously written program file-a file that has been currently moved to your workspace. If the system crashes, you will lose what was in the workspace, but you can reload the most recently saved version of the file.)

**Backing Up:** Anytime a crystaljock is working on a program or with data, he must regularly "save" his work or risk losing it in a crash. Saving means you instruct the computer to make a permanent copy of what is being worked on, so that it cannot be lost. You save something by using the SAVE command (see below). A crystaljock must specify that he is backing up or saving his files, or the Referee may assume he forgot to do so.

**LC and LC Matrixes:** All information that can be stored in a computer system is stored on LC (Liquid Crystal) matrixes. A sugar-cube sized matrix holds several hundred files or small programs and costs around \$100; a candy-bar sized matrix holds several thousand files or small programs and costs \$500. LC tabs, about 5mm square, will hold about twenty files or small programs each and costs \$25. These are popular novelty items-female crystaljocks have been known to use them to decorate their fingernails.

An LC matrix may be built into a computer or may be kept separate and only inserted into the computer when the information inside needs to be used. This a good way to back up data-4f a system crashes and data is lost, it may be re-copied back onto the system from a backup LC Matrix.

**Directory:** A directory is a list of the files contained in an account or stored on an LC memory chip. To be "in" a directory means you can look at a list of it's contents. You do this by using a LIST command. (Example: You have found a new account and guessed its password. The first thing you do is issue a LIST command. The system shows you a list of filenames for all files in that account.)

**HELP:** "HELP" is a feature that is available almost everywhere within the 'face, including the crystaljock's deck. HELP is de-

signed to show you how to use the particular system you have entered. The HELP feature on a system a crystaljock has just hacked into will enable him to learn how the system operates, and possibly allow him to find a weakness in security that will enable him to upgrade the level of his account or find a higher-level account.

**Mail:** Electronic mail is a way to leave messages to other users of a computer system. Most systems have some kind of mail. Bulletin boards are specifically designed for it. In order to send mail to someone, you must know their account name (but not their password). One can send mail, such as comments or complaints on how the system is working, directly to the System Operator (Sysop) without knowing his account name.

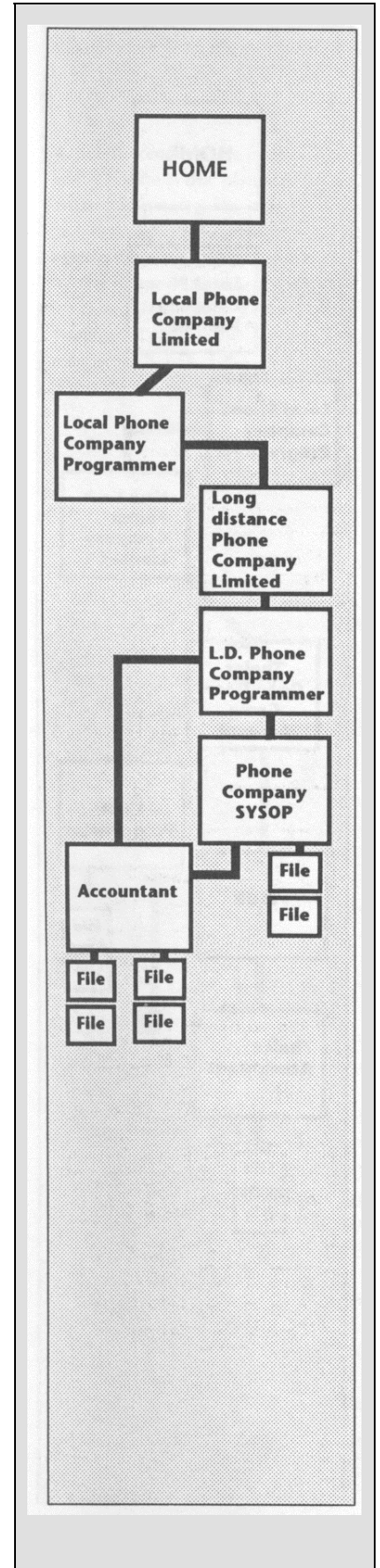
## COM-MANDS

There are two kinds of instructions a crystaljock can give a computer; commands and programs. A

command tells the computer to perform a simple action, like "COPY," or "SAVE." The commands listed here are simple ones, designed to allow a crystaljock to do useful things from his workspace area. A more complete list of commands, used in programming, is listed in the E-BASIC section on pg. 56.

**SAVE:** Stores the contents of the workspace in a file (Netrunner must give a filename, or the computer defaults to 1) the former name of the file [if it had one], or 2) the name of the last file that was in the workspace). This is the only way to make sure a file will not be erased off the workspace by a computer failure.

**COPY FILE <account name> TO <account name>:** Copies a file from one account to another, or to the same account under a different name. You might use this to copy an interesting file in one account to your own account. However, you cannot copy between systems, only accounts within a system.





**BREAK:** A command used to interrupt whatever the computer is doing.

**DELETE <filename>:** Erases specified file(s) from the account you are working within.

**LIST:** Lists the contents of an account or system (i.e., the names of its files).

**LOAD <filename>:** Moves a copy of a file from it's LC storage into your workspace. You must load a file in order to work on or

**(for the Referee)  
RUNNING  
THE  
'FACE**

This system may be used in conjunction with or in lieu of the system outlined in "View from the Edge." (A note to "real" programmers; this system is intended to make Netrunning more like actual programming. As part of this supplement, it is necessarily general in nature. Please feel free to elaborate on your own.)

Because of its free form, this system is more demanding of both the players and the Referee. The emphasis is on problem-solving rather than on dice-rolling. This means more work for the Referee, who must design puzzles for which there may be multiple answers. The players must use their ingenuity in finding creative solutions. An example of Netrunning under this system is given in "Trojan's Run."

The key to a Hardwired netrunning adventure is always information. This information is hidden away in some obscure account on some obscure computer, and the crystaljock has to get to it. A time limit helps to make it more exciting and increases the risks the crystaljock must take. Some examples of goals are: steal design information from a corporate computer to sell to the corporation's competition, break into computerized security for a particular building to which the crystaljock's team-mates need access, launder money by running it through a series of phony bank accounts, acquire an account on a particular system which a customer wants access

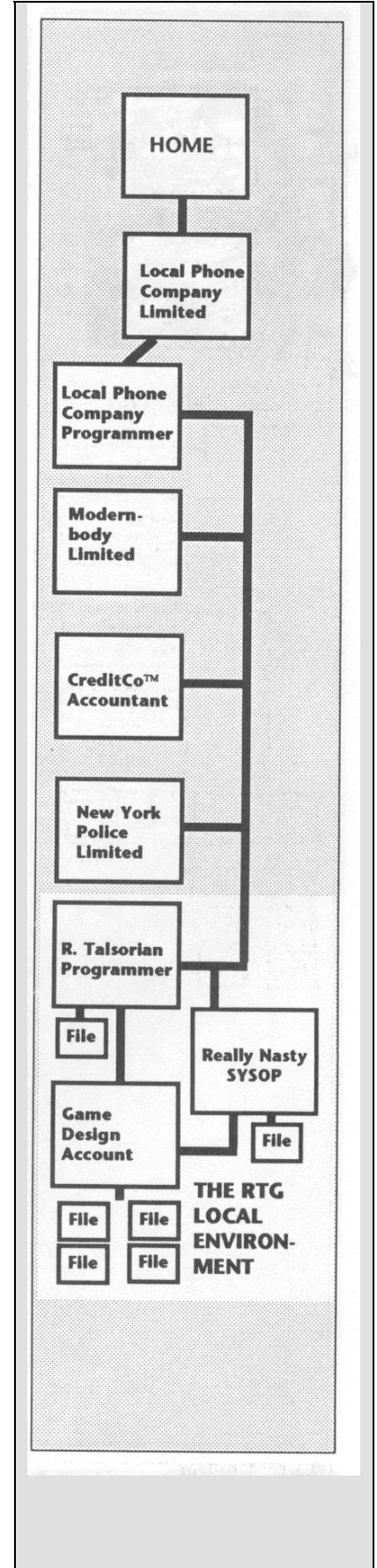
to, obtain information with which to blackmail someone.

Once the goal is established, the Referee must hide plenty of clues to help the crystaljock solve the puzzle. Clues can be hidden in Bulletin Board accounts, files in a particular system, electronic mail, records of sales in accounting databases, etc.

Depending on the Preferences of the Referee and players, netrunning may require some actual "programming" (i.e., the player running the crystaljock may actually have to write a program telling the computer what he wants it to do). This can be done using a combination of EBASIC and English. The Referee must decide whether the computer will understand the instructions properly. (Remember-computers do exactly what we tell them to do- not necessarily what we mean them to do!) See the Programming section for more details.

Of course, there is always the option of settling questions with the dice. The Referee may wish to establish percentages for success of a player's plan of action. This can be done by rolling the player's interface skill against that of the character who designed the defense system she's attacking. The Defense Against Crystaljock Table in the next section shows levels for various types of businesses.

The Referee must be careful not to give crystaljocks too much power. Clever crystaljocks can do the most amazing things with seemingly insignificant accounts! Since crystaljocks are dependent on their accounts, that is the best way to control them. If a crystaljock is getting too far too fast, kill the account he's using to do it. If he's being cocky and running amok in a computer, not only is the account likely to die, but the Sysops may call down corporate goons, mercenaries, or (if the crystaljock's lucky) the police to deal with the intruder.



(for the Referee)

**RUNNING  
THE  
'FACE**

Running the 'face includes certain risks. Unlike the netrunner of *Cyberpunk*, the crystaljock depends on stealth, not speed. Instead of Interface,

he uses a skill called **System Knowledge** to avoid being detected when moving into a new system.

Whenever a crystaljock logs onto a system, tries to hack an account, runs a program, etc., he must make a **System Knowledge** roll (see New Skills, pg. 21) against the level of Defense the target has erected. This Defense level is like the Task Difficulty of *Cyberpunk*, but relates only to computer systems. It is considered to be a web of passive and active alarm programs designed to detect illegal activity and then warn the Sysop (if his attention is elsewhere).

**AUTOMATIC DEFENSE AGAINST CRYSTALJOCK**  
(Target rolls 1D10 + Level of Defense)

Target	Level of Defense
Average Citizen's PC	5
Average Business	7
City Government	8
Local Police	10
Large Business	11
Credit Company	12
Low-Tech Orbital*	13-16
Medium-Tech Orbital**	15-18
Bank	15-18
System Accountant	16-19
Face Bank	19
High-Tech Orbital***	17-20

\*Modernity, Pointsman Pharmaceuticals  
 \*\*Tempel, Mikoyan-Curovich, Kikuyu  
 \*\*\*Thaler, Bank of Borneo, Korotev

These difficulties are against passive systems- alarms which have been placed within a local environment to catch intruders. The moment an alarm is tripped (the

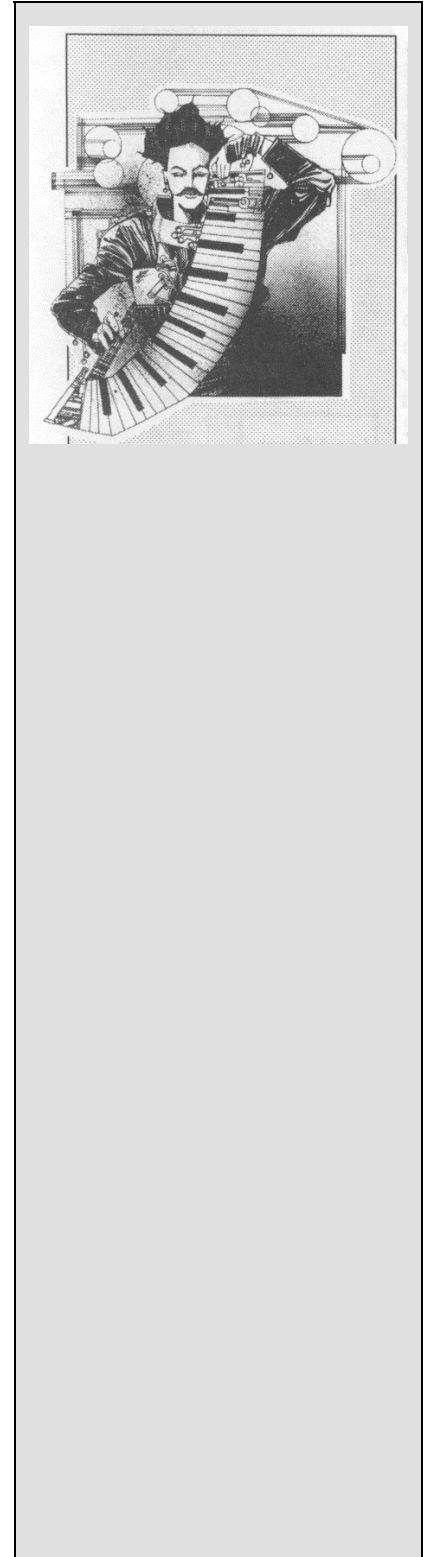
crystaljock fails a roll), the Sysop of the computer is alerted. At that point, the crystaljock will make all System Knowledge Rolls against the System Knowledge skills of the individual Sysop.

Example: Johnny Hack is entering Tempel. Tempel's autodefense difficulty is 16. Johnny blows it and misses getting past the defenses. In the next turn, the Tempel Sysop comes on line, looking for Johnny. Unlike the puny passive defenses of the system, the Sysop has an INT of 9 and a System knowledge of 8 (total of 17). He will also get to roll his own System Knowledge Roll against Johnny's. The Tempel hack has just gotten a lot harder.

**Fumbles:** If a crystaljock rolls a 1 while attempting to act within a system, he has a possibility of fumbling. Roll 1D10- on a 5 or lower, you have fumbled. Move to the table below, roll D100, and apply the result.

**CRYSTALJOCK FUMBLES**  
(For any roll resulting in a crash, roll on Down Time table-see "Crashes")

Result	Roll
Logoff (disconnect from Net)	01-10
Erase workspace (recoverable if saved)	11-15
Crash deck	16-20
Erase current file (not recoverable)	21-25
Erase all Home files	26-30
Crash system	31-40
Erase all Local files	41-45
Hit by Crasher (roll on Crasher Hit Table)	46-50
Account dies	51-70
Crash system-account dies	75-80
Erase Local files-account dies	81-85
Crash system --caught by Sysop	86-89
Erase all system files*	91-94
Crash Net	95-97
Erase system files --caught by Sysop*	98-99
Crash Net-caught by Sysop	100



## CRASHES

A Crash is a catastrophic system failure caused by programming error or physical disruption of the hardware.

A crash can be as simple as a total shutdown or as complex as imagination suggests. (Remember Nomad running around the Enterprise screeching "Sterilize!") Whatever its manifestation, a crash will take a certain amount of Down Time to fix. The Sysops need time to find out what went wrong and restore the affected account or the system to operational status. If the crash occurs on the crystaljock's deck, he will have to spend this time figuring out what happened and fixing it himself before he can do any more running.

### DOWNTIME TABLE

D10 Roll	Downtime
1	10 minutes
2	30 minutes
3	1 hour
4	4 hours
5	12 hours
6	1 day
7	2 days
8	4 days
9	1 week
10	1 month

### CRASHER HIT TABLE (roll D6):

Roll	Result
1	System crashes
2	Virus attacks system-all files destroyed
3	Crasher wipes crystaljock's deck and any memory (LQ) attached
4	Crystaljock's favorite bulletin board crashes (down for a week)
5	All system & deck files overwritten (for example, with "CAP'N CRASH RULES" over and over)
6	System crashes-all system accounts lost

## HACKING

Assuming you've gotten into the target system, your next step is to go hacking- i.e., snooping in other

people's accounts for things you have no business messing with.

First the crystaljock must obtain an account name (or number) for his target. This is fairly easy, and can often be accomplished by simple snooping. Account names may be written down near workstations, included in correspondence, thrown out in the trash, or listed in databases.

Once an account is found, the next step is to guess the password. On a purely mechanistic level, the Referee can decide how hard it will be to guess and assign the password a value (from 10 to 30) the crystaljock will have to beat with a System Knowledge roll. For every three hours in the 'face, the crystaljock may make one attempt to "hack" this password.

Preferably, the Referee should have an actual password in mind. The following guidelines will help:

- 1) 30% of low- and mid-level users will have very commonplace passwords, like "sex," "password," or "secret."
- 2) 20% will use names, birthdates, etc. (their own or their families').
- 3) 5% of all Sysops will use guessable passwords such as "God" and "Superuser."

However, it is usually far more satisfying to have the player actually figure out the password instead of relying on the dice. The crystaljock who does his homework will find it easier to guess passwords. This is where the crystaljock's Special Ability of Intuition comes in. The Referee can ask the player to make rolls using this Ability (in conjunction with the 'jock's INT and 1 D10), with a successful roll resulting in the Referee giving the player clues and hints about the nature of the password.

## CRASHERS

A Crasher is a crystaljock (usually an amateur) whose sole purpose in life is to crash as many systems as possible, as destructively as possible. Crashers, like Murphy, always choose the worst possible moment. Referees should treat crashers as a 'wandering monster' - hazards that may occasionally crop (a 10% chance on every run) up to bedevil a crystaljock working in the 'face.

An example: Crackerjack is trying to hack an account belonging to another crystaljock named Dryad. He does his homework and collects information about her, trying for an Intuition Roll. The roll is successful, and the Referee tacitly mentions, "Well, you have noticed that she likes mythology and has used handles like "Nymph" and "Sylph" in the past." Hmmm.

The player tells the Ref "I try all kinds of mythological names--2' if he stopped here he'd still have to make a System Knowledge roll, but he goes on—"like silkie, naiad, and satyr." The Referee had decided the password would be "naiad," so the crystaljock succeeds in logging onto Dryad's account.

Of course, it is possible to set up a program to try hundreds of common words as passwords and report back when it succeeds, but most systems are on guard against this method and will take action against a crystaljock who tries to hack in this way. If guessing doesn't work, a desperate crystaljock may resort to spying, bribery, or blackmail in order to obtain a password.

## PROGRAMMING

Simple instructions can be performed right away, but if the task the crystaljock wants the computer to perform is complicated, he will have to write a program. A program is a series of commands written and saved in a file, all of which are performed in sequence by the computer when it is told to "RUN" that file.

There are two main advantages to writing a program. The first is that computers can do things much faster than people—so if, for example, you wished to calculate projected values for 2,500 different stocks, you need only describe the calculation once and tell the computer to apply it to all the stocks. The other advantage is that the crystaljock can run his completed program as many different times as he likes - months, even years after writing it - simply by loading it and saying "RUN."

Writing a program may require anywhere from one to a thousand hours (Ref's discretion) of programming time, depending on

the complexity of the task. If the Referee and players wish, they may simply establish how long it takes to write the program (game time) and not bother with the actual programming process. This time includes testing and debugging the program.

But netrunning is not just programming. It is interacting with computer systems and with the people who run and use them. Programming skill should be added to a crystaljock's roll only when the crystaljock is actually writing a program; a set of instructions which are saved in a file and which the computer will perform on command, as many times as is needed. An example of a program is the clumsy password-guessing method which submits every word in the system dictionary to a computer system in the hope of finding a password. A computer doesn't automatically know how to do this complicated and specific a task. The crystaljock must give it instructions.

And that means EBASIC.

## EBASIC

EBASIC, or Evolved BASIC, is the universal programming language of the *Hardwired* world. It has replaced all

other languages, and it is spoken by every computer everywhere. EBASIC is a semi-intelligent language that can interpret simple English instructions as well as its own commands. For example, a crystaljock wishing to break into a secured computer and steal a file while simultaneously providing himself an alibi could write the following program:

```
WAIT 2 HOURS
CALL 786-7787 (Korolev)
LOGON IVAN SMITIKOV
PASSWORD CHEETOPIX
ACCESS SECUREFILES
DIRECTORY
LOAD FILE SECRETDATA
SAVE IN DECK DIRECTORY
LOGOFF
```

The crystaljock tells his deck to run this program, then heads out to spend a night on the town, making sure he is seen by a number of people during the next three or four hours. The deck obediently waits two hours, then logs on to the Korolev computer and downloads the desired file while the crystaljock is establishing his alibi.

How well a computer will interpret English instructions will depend on the computer's sophistication and its familiarity with the crystaljock. (Once a crystaljock explains a word or phrase to a computer, it will store his definition and refer to it in the future. So be careful what you tell the computer!) As a rule, the average computer will respond as follows to English instructions:

- 70% Computer correctly interprets and executes instructions
- 15% Computer thinks it understands instructions and acts accordingly
- 10% Computer doesn't understand instructions and requests clarification
- 5% Computer crashes trying to figure out instructions

**EBASIC COMMANDS**

Note - the Referee may choose to allow crystaljocks to create new commands. This requires writing a program, which will take anywhere from one to a thousand hours, depending on the complexity of the task to be performed by the command, and the Referee's discretion.

**COPY FILE FROM <account name> TO <account name>**

Copies a file from one account to another, or to the same account under a different name.

**END:** The last command in a program. This means "stop what you are doing." If no "END" command is given, the computer will spend forever looking for more commands.

**BREAK:** A command used to interrupt whatever the computer is doing (like spending forever looking for more commands).

**DELETE FILE:** Erases specified file(s) from memory, or edits specified commands or data out of the workspace.

**LIST:** Lists the contents of an account or system (i.e., the names of its files).

**IF ... THEN:** A command which is executed only if the specified condition is met. (Example: IF DATE = JANUARY 1 THEN WRITE "HAPPY NEW YEAR") Another version of IF..THEN includes ELSE, allowing an either/or statement. (Example: IF DATE = JANUARY 1 THEN WRITE "HAPPY NEW YEAR" ELSE WRITE "ANOTHER BORING DAY")

**INPUT:** Accepts data either from a terminal or from a file. (Example: INPUT CHICAGO TELEPHONE DIRECTORY TO WORKSPACE will cause the computer to try to load the Chicago phone directory into your workspace. Of course, your deck may have a nervous breakdown trying to cope with all that data .... )

**LOAD:** Moves a copy of a file from LC storage into your workspace. You must load a file in order to edit it.

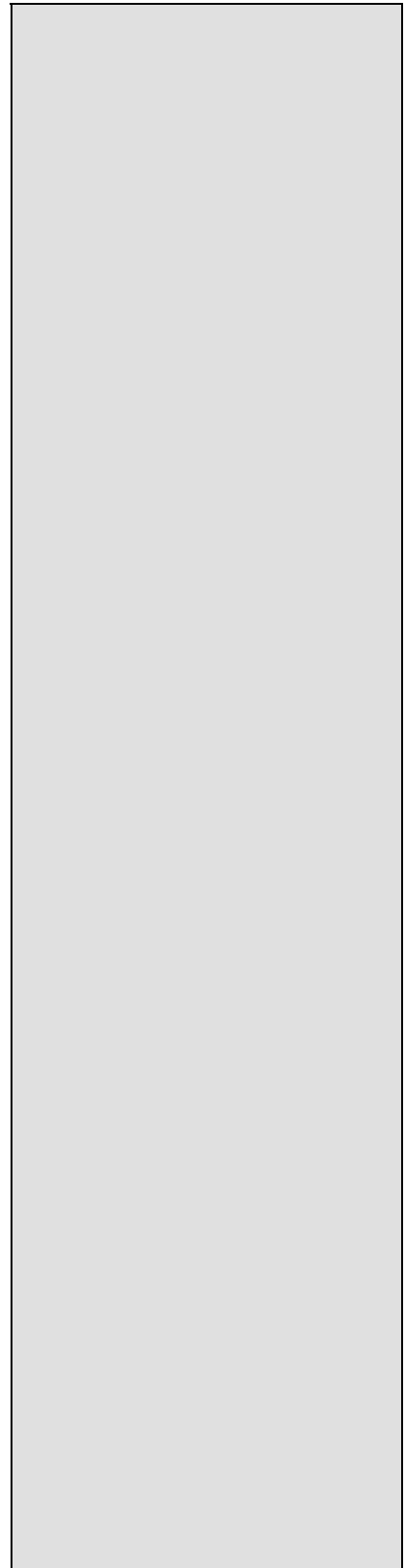
**RUN:** Perform the program currently in the workspace.

**RUN <Program Name>:** Executes the specified program.

**SAVE:** Stores the contents of the workspace in a file (crystaljock must give a filename, or the computer defaults to 1) the former name of the file[if it had one], or 2) the name of the last file that was in the workspace).

**SEARCH:** Looks through a file or database until it locates specified data (Example: SEARCH CHICAGO PHONE DIRECTORY FOR "JOE SMITH").

**PATH ///:** This instructs the computer to move a specified file along a certain path. Each Local environment the path passes through is separated by a slashmark. Example: PATH /Tokyo/New York/London/.



**SORT:** Used to manipulate data (example: SORT the Chicago phone directory by phone number. Let the operator try finding Joe Smith now.).

**TRACE:** Traces the path used by a crystaljock or program back to the directory and terminal where it originated. This command is used a lot by Sysops trying to identify crystaljocks using accounts illegally. It takes a little while to operate (I D6 turns), so there is a chance of logging off in time if you notice you're being traced.

**WRITE:** Writes either a message (must be in quotes following command; see example under IF ... THEN) or the contents of a file to a specified destination (like another crystaljock's workspace, or a file, writing over whatever was there, of course). If no destination is specified, the data is written to the crystaljock's own workspace.

**LOOP:** A command causing the computer to repeat a set of commands until some condition is met (sort of a program within a program). There are three kinds of loops: "for" loops, "while" loops and "until" loops. A "for" loop executes a specified number of times; a "while" loop keeps executing until its condition is no longer true (possibly forever); an "until" loop keeps working until its conditions have been met.

A loop could be a simple counting program, like LOOP FOR I TO 100, which tells the computer to do this operation one hundred times. Or it could be conditional, such as LOOP UNTIL CODE IS BROKEN, which instructs the computer to keep repeating it's task until a specific goal has been achieved.

**SOME PROGRAM EXAMPLES**

1) The Program:  
LOOP FOR 1 TO 100,000  
BREAK  
NEXT

(Issues a BREAK command 100,000 times; this is the structure of the "Hammer" program from *Cyberpunk*)

Note that a NEXT command marks the end of the loop. This is the command that tells the computer to increment its counter and return to the top of the loop. If the NEXT command is left out, the commands in the broken loop will only be executed once, and the computer will either continue with the rest of the program or have a nervous breakdown because it can't find the NEXT that should go with the FOR (computers care a lot about such details).

2) The Program:  
LOOP WHILE PASSWORD NOT  
"SWORDFISH"  
WRITE "ENTER PASSWORD?" INPUT  
PASSWORD  
END

(Keeps a crystaljock from proceeding until s/he has entered the correct password. This is the basis of the *Cyberpunk Code Wall*.) This could also be written:

LOOP UNTIL PASSWORD IS "SWORD-  
FISH" WRITE "ENTER PASSWORD"  
INPUT PASSWORD  
END

Note that an END command marks the end of the loop. Whatever is between the LOOP command and the END command is what gets repeated.

